

# CEL 51, DCCN, Monsoon 2020

## Lab 4: Prototyping a Network

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### Objective:

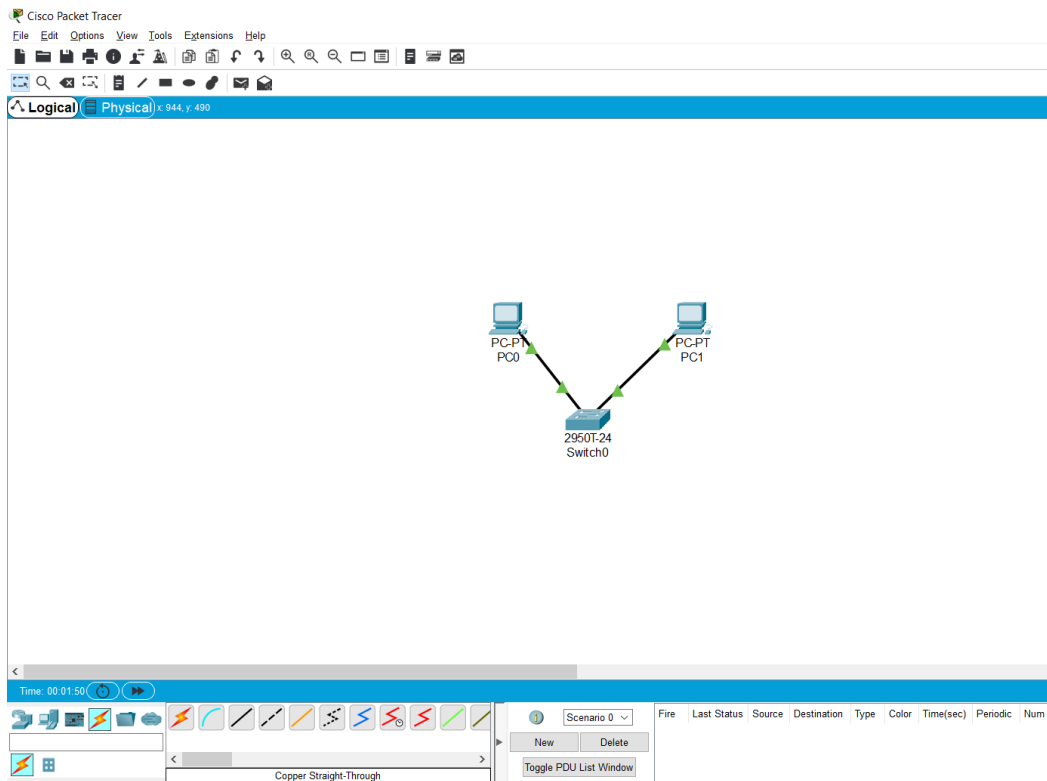
Prototype a network using Packet Tracer

### Background

A client has requested that you set up a simple network with two PCs connected to a switch. Verify that the hardware, along with the given configurations, meet the requirements of the client.

### Step 1: Set up the network topology

- Add two PCs and a Cisco 2950T switch
- Using straight-through cables, connect **PC0** to interface **Fa0/1** on **Switch0** and **PC1** to interface **Fa0/2** on **Switch0**.



c) Configure PC0 using the **Config** tab in the PC0 configuration window:

- a. IP address: 192.168.10.10
- b. Subnet Mask 255.255.255.0

The image shows a configuration window for PC0. The window has a title bar with a PC icon and the text "PC0". Below the title bar are four tabs: "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Config" tab is selected. On the left side of the "Config" tab is a sidebar with a tree view. The tree view has two main sections: "GLOBAL" and "INTERFACE". Under "GLOBAL" are "Settings" and "Algorithm Settings". Under "INTERFACE" are "FastEthernet0" (which is selected and highlighted in blue) and "Bluetooth". The main area of the window displays the configuration for "FastEthernet0". It includes fields for "Port Status" (checked "On"), "Bandwidth" (radio buttons for "100 Mbps" and "10 Mbps", with "100 Mbps" selected), "Duplex" (radio buttons for "Half Duplex" and "Full Duplex", with "Full Duplex" selected), and "MAC Address" (text field with value "0001.4321.AC44"). Below these are two sections: "IP Configuration" and "IPv6 Configuration". In "IP Configuration", "Static" is selected with a radio button, and the "IPv4 Address" is "192.168.10.10" and "Subnet Mask" is "255.255.255.0". In "IPv6 Configuration", "Static" is selected with a radio button, and the "IPv6 Address" is empty. The "Link Local Address" is "FE80::201:43FF:FE21:AC44". At the bottom left of the window is a "Top" button with a square icon.

PC0

Physical **Config** Desktop Programming Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**INTERFACE**

- FastEthernet0**
- Bluetooth

**FastEthernet0**

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.4321.AC44

IP Configuration

☐ DHCP

☒ Static

IPv4 Address 192.168.10.10

Subnet Mask 255.255.255.0

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local Address: FE80::201:43FF:FE21:AC44

☐ Top

- d) Configure PC1 using the **Config** tab in the PC1 configuration window
- IP address: 192.168.10.11
  - Subnet Mask 255.255.255.0

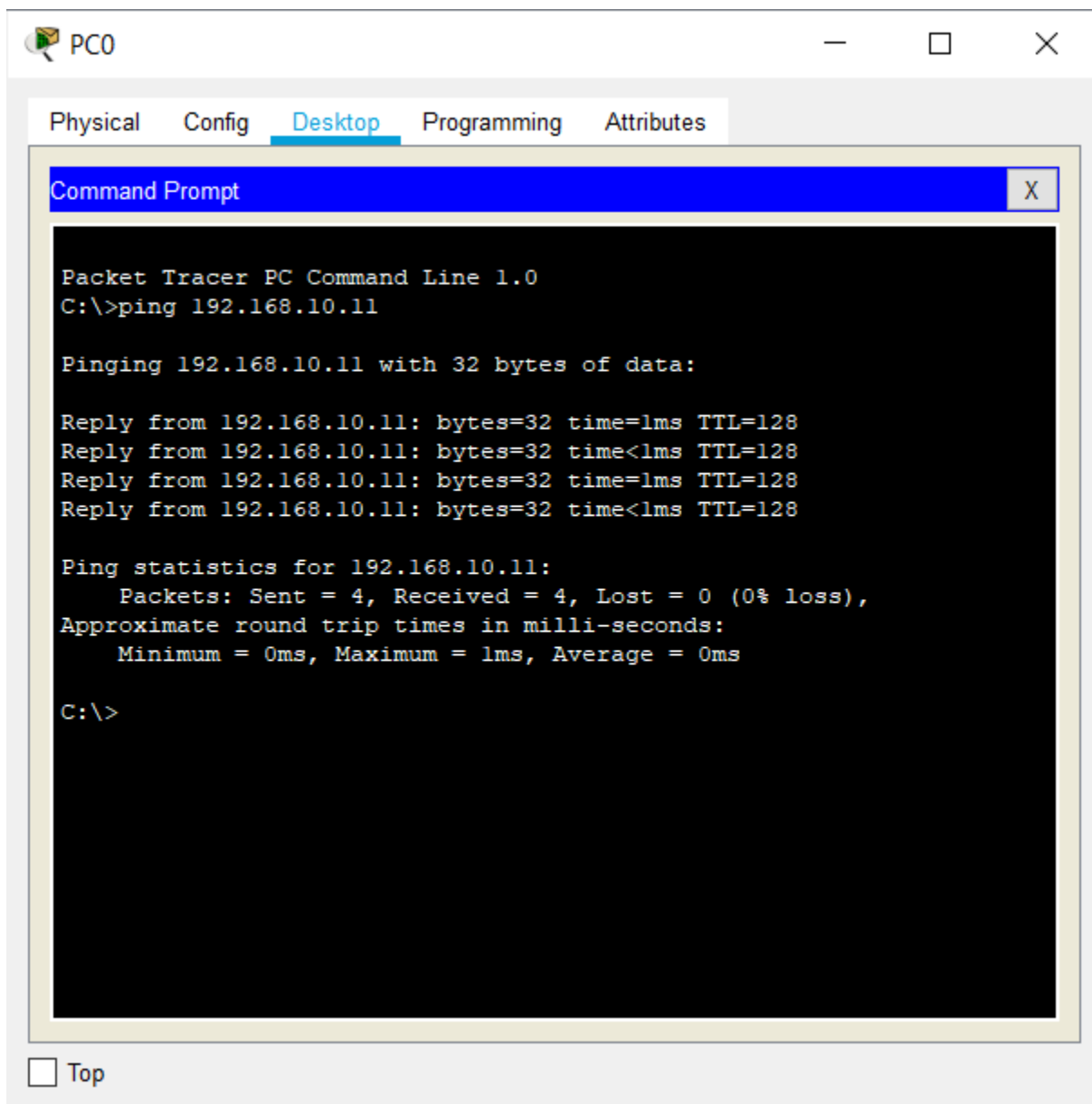
The image shows a PC1 configuration window with the following structure:

- Window Title:** PC1
- Tabs:** Physical, Config, Desktop, Programming, Attributes
- Left Sidebar:**
  - GLOBAL**
    - Settings
    - Algorithm Settings
  - INTERFACE**
    - FastEthernet0** (selected)
    - Bluetooth
- Main Content Area (FastEthernet0):**
  - Port Status: ☒ On
  - Bandwidth: ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
  - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
  - MAC Address: 000C.CF06.78C3
  - IP Configuration:**
    - ☐ DHCP
    - ☒ Static
    - IPv4 Address: 192.168.10.11
    - Subnet Mask: 255.255.255.0
  - IPv6 Configuration:**
    - ☐ Automatic
    - ☒ Static
    - IPv6 Address: [Empty field]
    - Link Local Address: FE80::20C:CFFF:FE06:78C3

At the bottom left, there is a checkbox labeled "Top".

## Step 2: Test connectivity from PC0 to PC1

- a) Use the **ping** command to test connectivity.
  - a. Click PC0.
  - b. Choose the **Desktop** tab.
  - c. Choose **Command Prompt**.
  - d. Type: **ping 192.168.10.11** and press *enter*.
- b) A successful **ping** indicates the network was configured correctly and the prototype validates the hardware and software configurations. A successful ping should resemble the below output:



The screenshot shows the Packet Tracer interface for PC0. The 'Desktop' tab is selected, and the 'Command Prompt' application is open. The command prompt displays the output of the 'ping 192.168.10.11' command, showing four successful replies with 32 bytes of data, a time of 1ms, and a TTL of 128. The ping statistics show 4 packets sent, 4 received, and 0% loss.

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.11

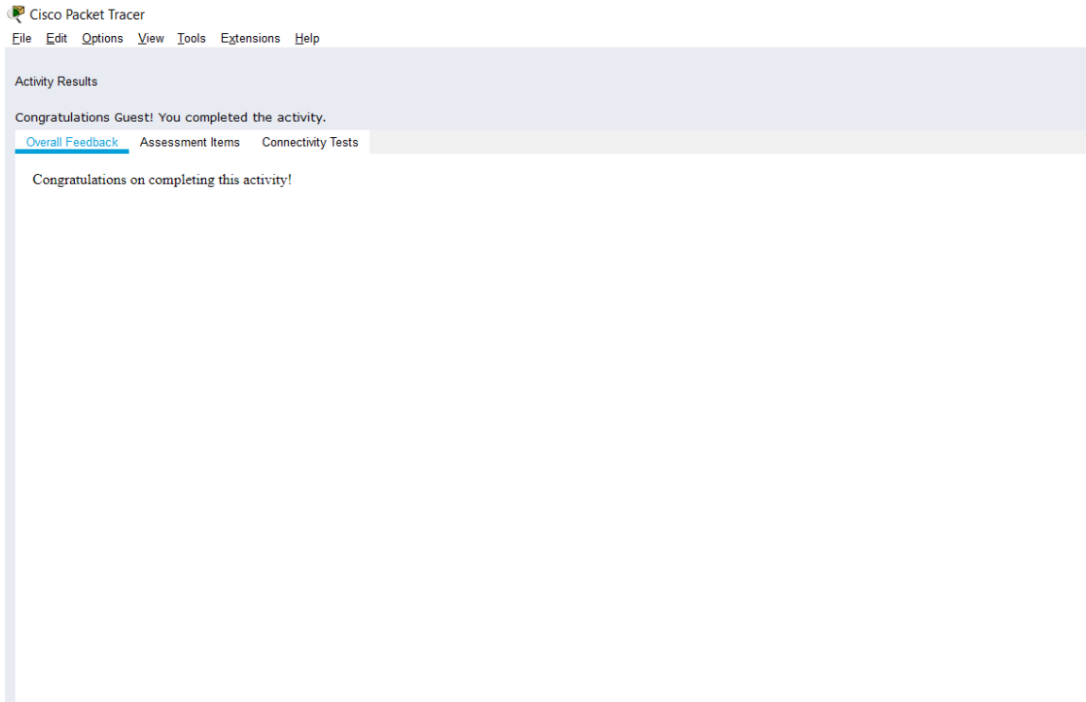
Pinging 192.168.10.11 with 32 bytes of data:

Reply from 192.168.10.11: bytes=32 time=1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128
Reply from 192.168.10.11: bytes=32 time=1ms TTL=128
Reply from 192.168.10.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- c) Close the configuration window.
- d) Click the **Check Results** button at the bottom of the instruction window to check your work..

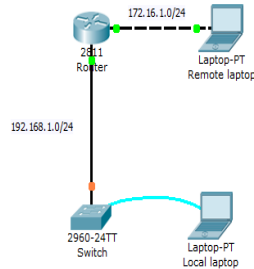


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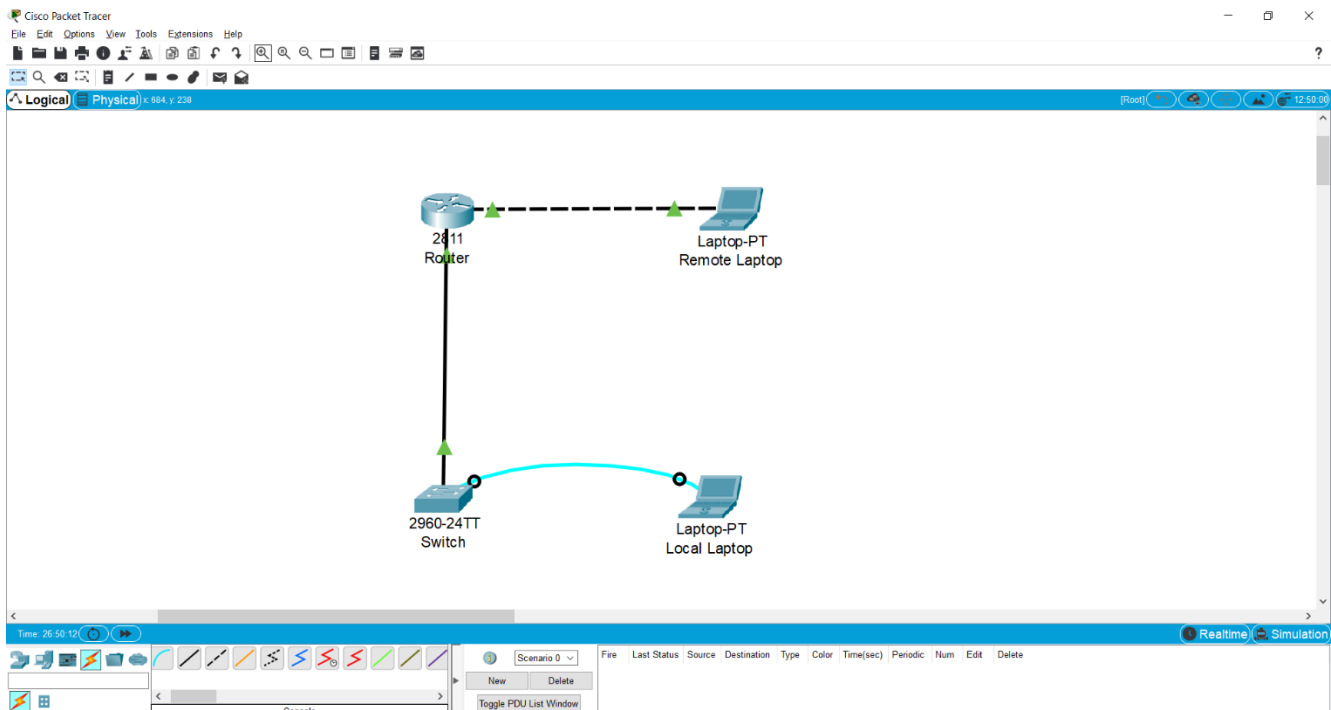
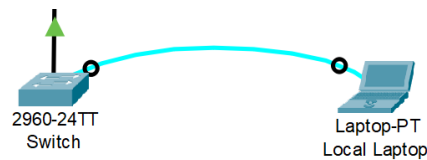
## Lab 4.1: Basic configuration - hostname, motd banner, passwd etc

### Objective:

This lab will test your ability to configure basic settings such as hostname, motd banner, encrypted passwords, and terminal options on a Packet Tracer 6.2 simulated Cisco Catalyst switch.



1. Use the local laptop connect to the switch console.



Configuration of remote laptop:

The screenshot shows the 'Remote Laptop' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'GLOBAL' (Settings, Algorithm Settings) and 'INTERFACE' (FastEthernet0, Bluetooth). The 'FastEthernet0' interface is selected, showing the following configuration:

- Port Status: ☒ On
- Bandwidth: ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0001.C7CA.1A24
- IP Configuration: ☐ DHCP ☒ Static
  - IPv4 Address: 172.16.1.2
  - Subnet Mask: 255.255.255.0
- IPv6 Configuration: ☐ Automatic ☒ Static
  - IPv6 Address: [empty field]
  - Link Local Address: FE80::201:C7FF:FECA:1A24

At the bottom left, there is a 'Top' button.

Configuration of Fast ethernet0/0 connection between the router and the remote laptop

The screenshot shows the 'Router' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'GLOBAL' (Settings, Algorithm Settings), 'ROUTING' (Static, RIP), 'SWITCHING' (VLAN Database), and 'INTERFACE' (FastEthernet0/0, FastEthernet0/1). The 'FastEthernet0/0' interface is selected, showing the following configuration:

- Port Status: ☒ On
- Bandwidth: ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 0003.E491.E901
- IP Configuration: IPv4 Address: 172.16.1.1, Subnet Mask: 255.255.255.0
- Tx Ring Limit: 10

Below the configuration fields, there is a section titled 'Equivalent IOS Commands' with a text area containing the following commands:

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

At the bottom left, there is a 'Top' button.

## Configuration of Fast ethernet0/1 connection between the router and the switch

Router

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0003.E491.E902

IP Configuration

IPv4 Address 192.168.1.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

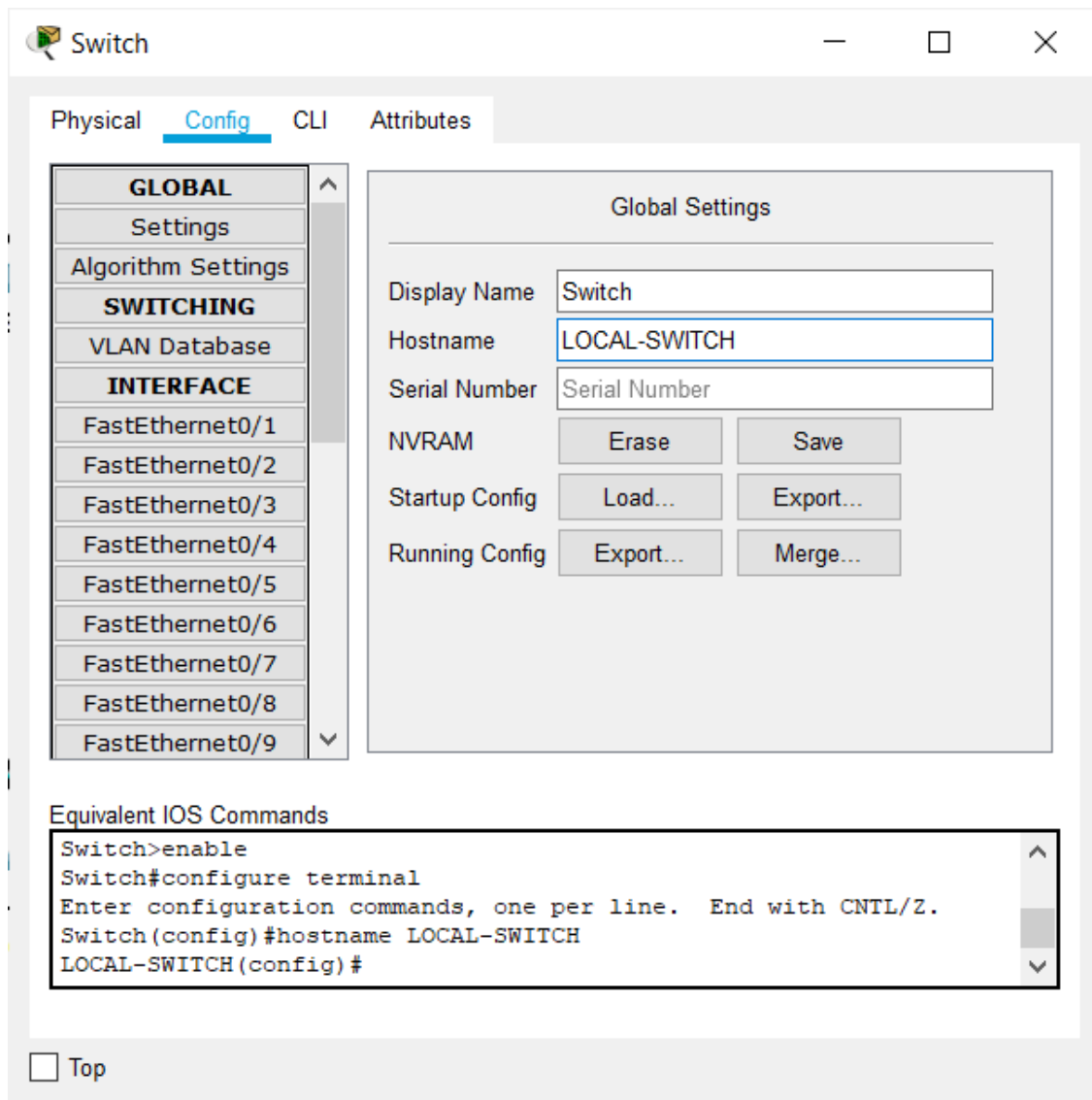
Equivalent IOS Commands

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
```

☐ Top



## 2. Configure Switch hostname as LOCAL-SWITCH



The screenshot shows the configuration window for a switch in Cisco Packet Tracer. The window has tabs for Physical, Config, CLI, and Attributes. The 'Config' tab is active, showing a tree view on the left with categories: GLOBAL (Settings, Algorithm Settings), SWITCHING (VLAN Database), and INTERFACE (FastEthernet0/1 through FastEthernet0/9). The 'Global Settings' section on the right contains the following fields and buttons:

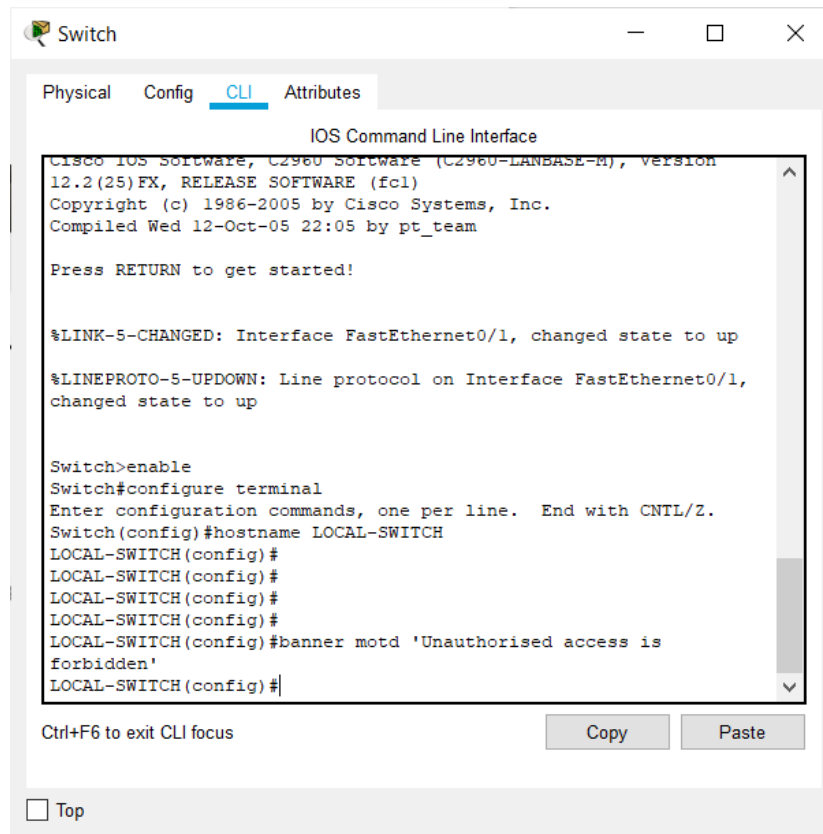
Global Settings	
Display Name	Switch
Hostname	LOCAL-SWITCH
Serial Number	Serial Number
NVRAM	Erase Save
Startup Config	Load... Export...
Running Config	Export... Merge...

Below the settings is a section titled 'Equivalent IOS Commands' with a text area containing the following commands:

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname LOCAL-SWITCH
LOCAL-SWITCH(config)#
```

At the bottom left of the window is a 'Top' button.

### 3. Configure the message of the day as "Unauthorized access is forbidden"



Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), version 12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!

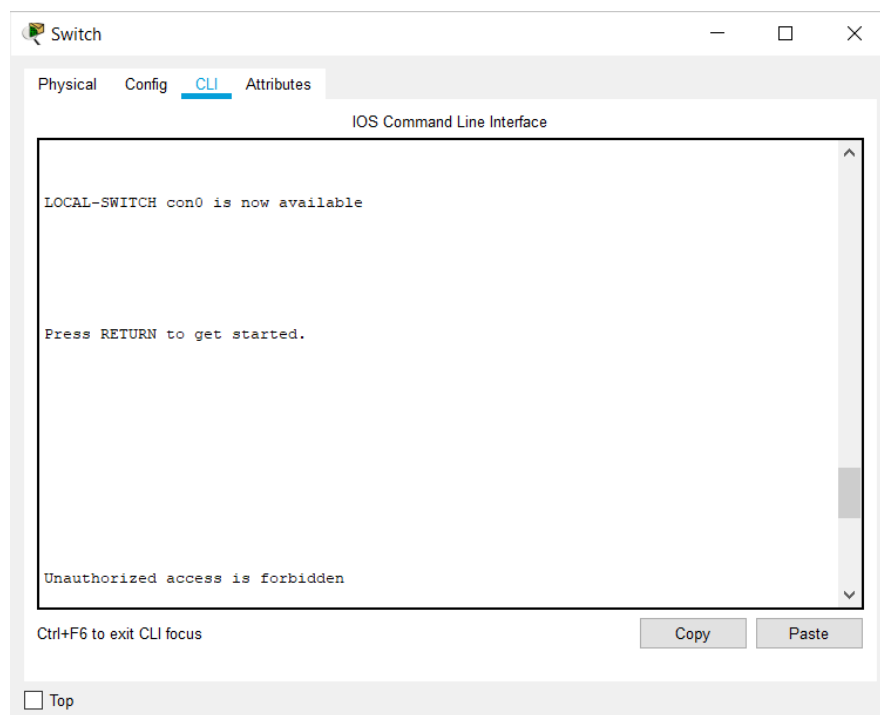
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname LOCAL-SWITCH
LOCAL-SWITCH(config)#
LOCAL-SWITCH(config)#
LOCAL-SWITCH(config)#
LOCAL-SWITCH(config)#
LOCAL-SWITCH(config)#banner motd 'Unauthorised access is
forbidden'
LOCAL-SWITCH(config)#|
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top



Switch

Physical Config CLI Attributes

IOS Command Line Interface

```
LOCAL-SWITCH con0 is now available

Press RETURN to get started.

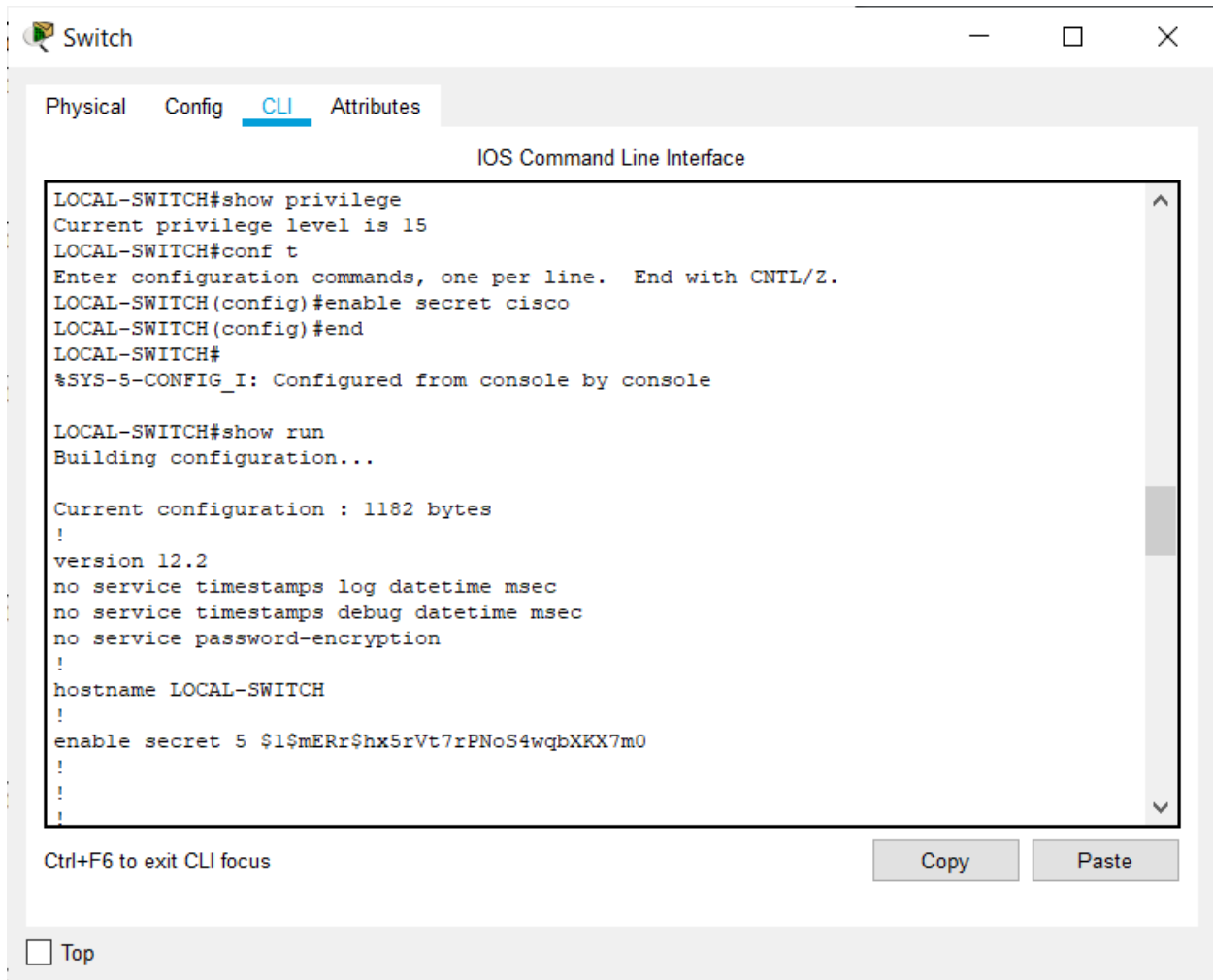
Unauthorised access is forbidden
```

Ctrl+F6 to exit CLI focus

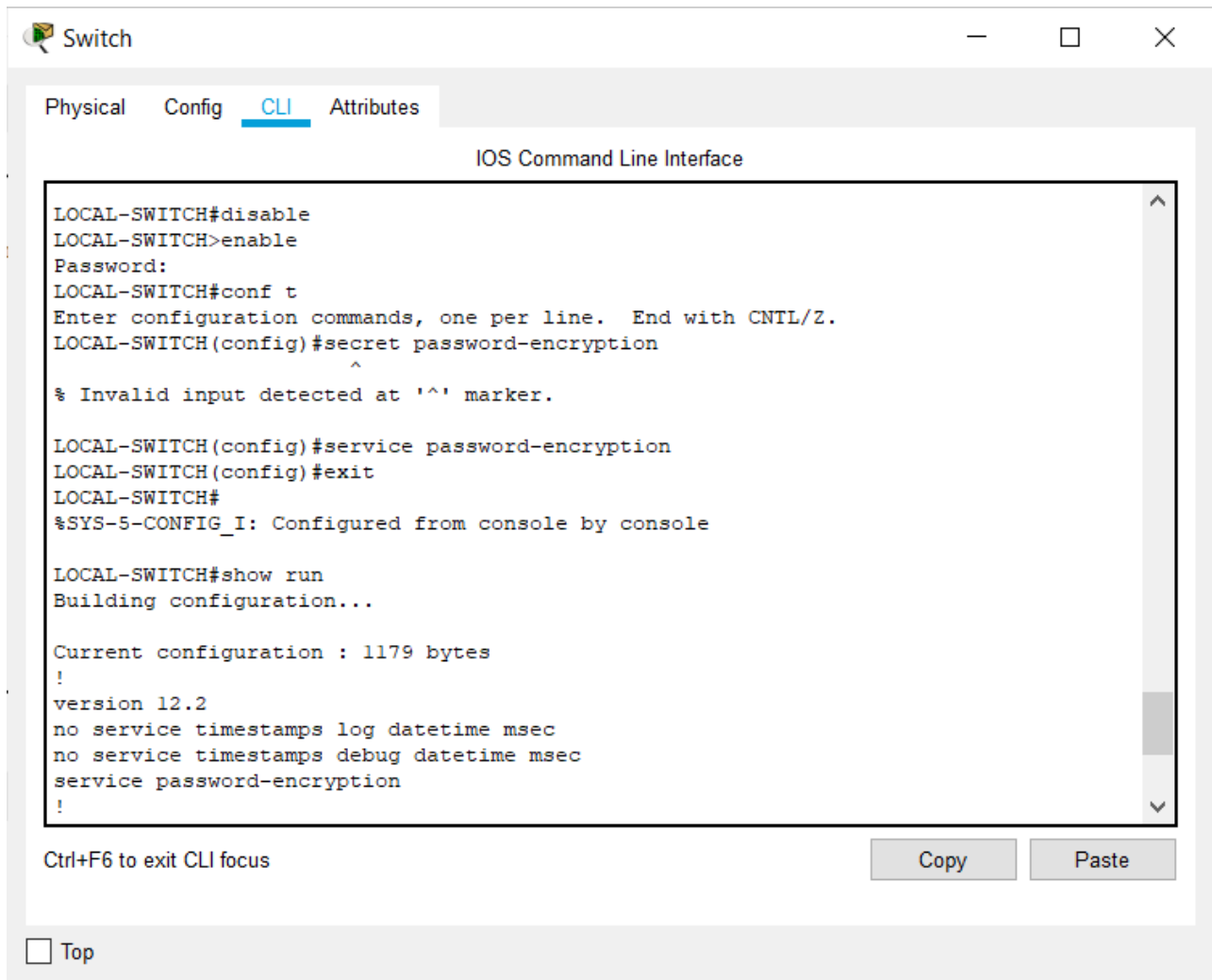
Copy Paste

☐ Top

4. Configure the password for privileged mode access as "cisco". The password must be md5 encrypted



5. Configure password encryption on the switch using the global configuration command



The screenshot shows a network switch configuration window titled "Switch". It has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main area is titled "IOS Command Line Interface" and contains a text box with the following text:

```
LOCAL-SWITCH#disable
LOCAL-SWITCH>enable
Password:
LOCAL-SWITCH#conf t
Enter configuration commands, one per line. End with CNTL/Z.
LOCAL-SWITCH(config)#secret password-encryption
^
% Invalid input detected at '^' marker.

LOCAL-SWITCH(config)#service password-encryption
LOCAL-SWITCH(config)#exit
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

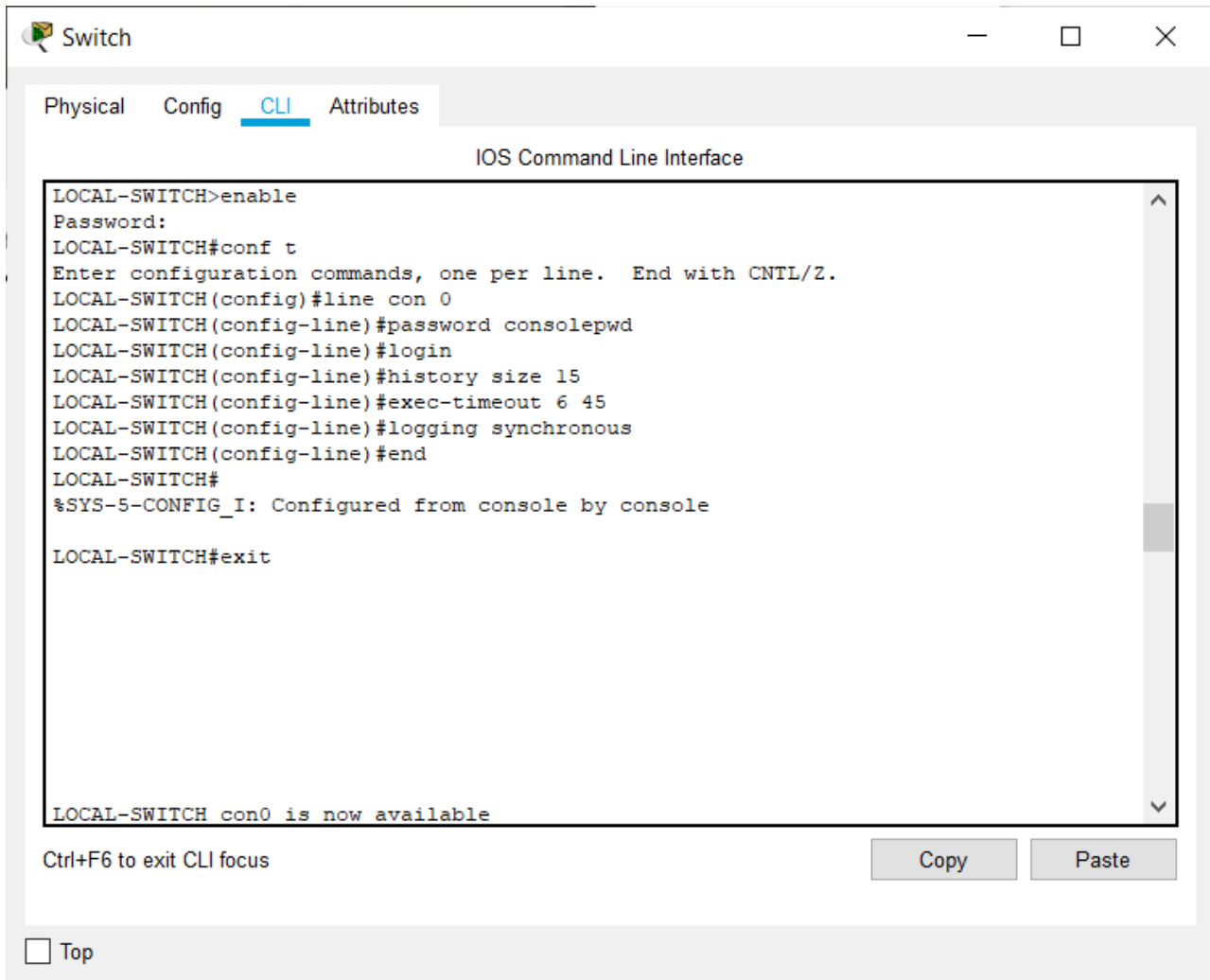
LOCAL-SWITCH#show run
Building configuration...

Current configuration : 1179 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
```

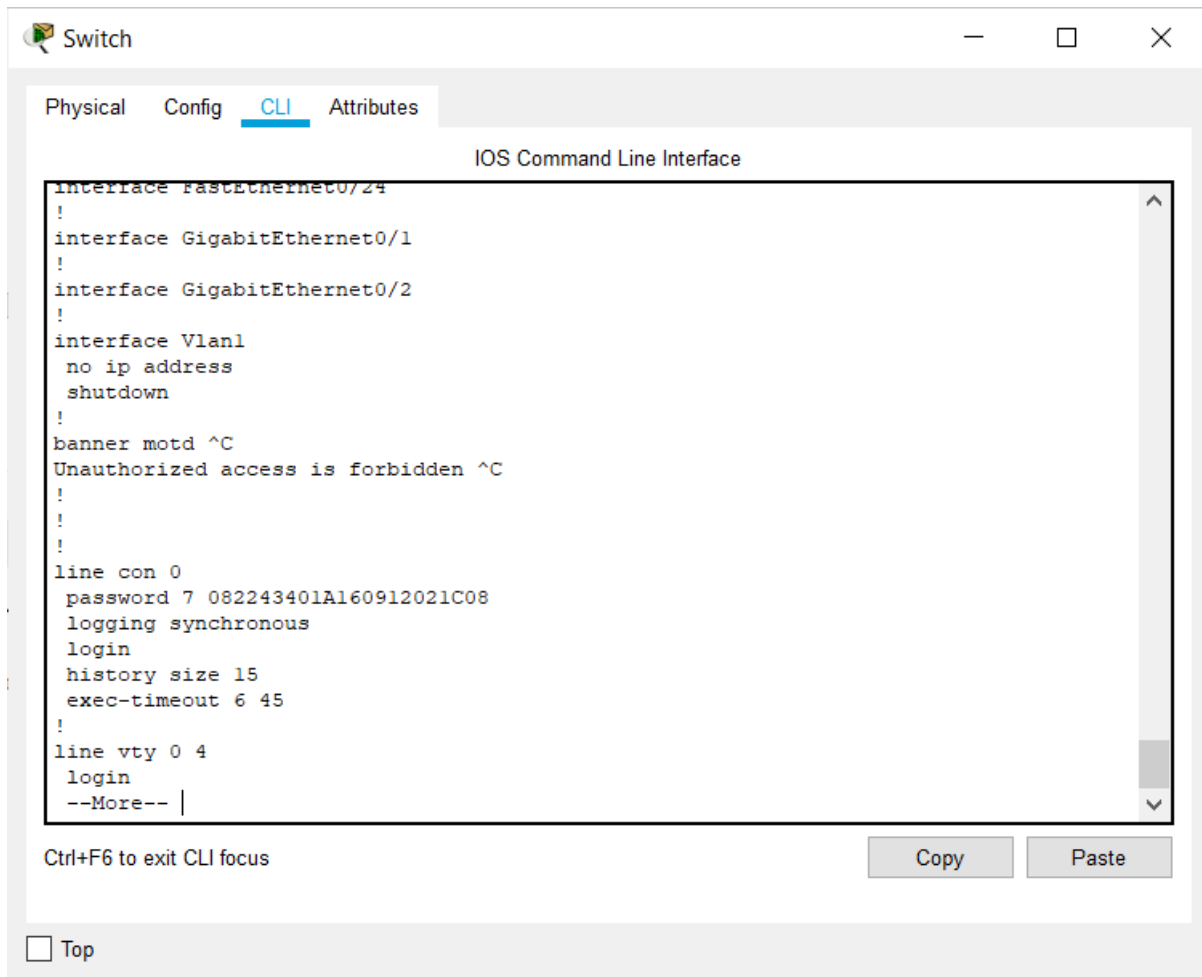
Below the text box, there is a status bar with the text "Ctrl+F6 to exit CLI focus" on the left and "Copy" and "Paste" buttons on the right. At the bottom left, there is a checkbox labeled "Top".

6. Configure CONSOLE access with the following settings :

- Login enabled
- Password : whatever you like
- History size : 15 commands
- Timeout : 6'45"
- Synchronous logging



Show run command to display the configurations of the console of the switch



The screenshot shows a window titled "Switch" with a tabbed interface. The "CLI" tab is selected, displaying the "IOS Command Line Interface". The output of the "show run" command is visible, showing the configuration for the console (line con 0) and other interfaces. The configuration includes a password, logging, and login settings for the console. The output is truncated with "--More--" at the bottom.

```
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
  no ip address
  shutdown
!
banner motd ^C
Unauthorized access is forbidden ^C
!
!
!
line con 0
  password 7 082243401A160912021C08
  logging synchronous
  login
  history size 15
  exec-timeout 6 45
!
line vty 0 4
  login
--More-- |
```

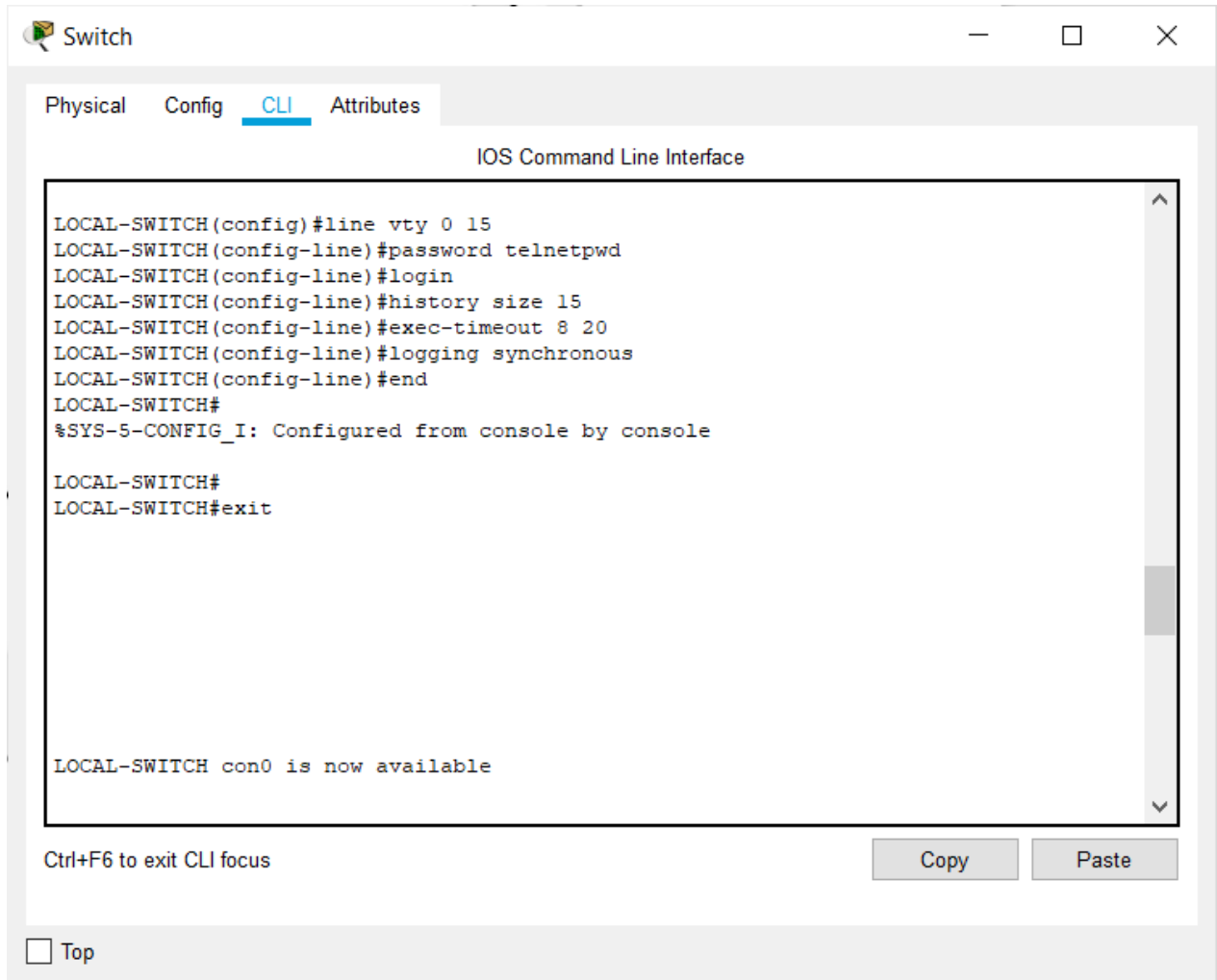
Ctrl+F6 to exit CLI focus

Copy Paste

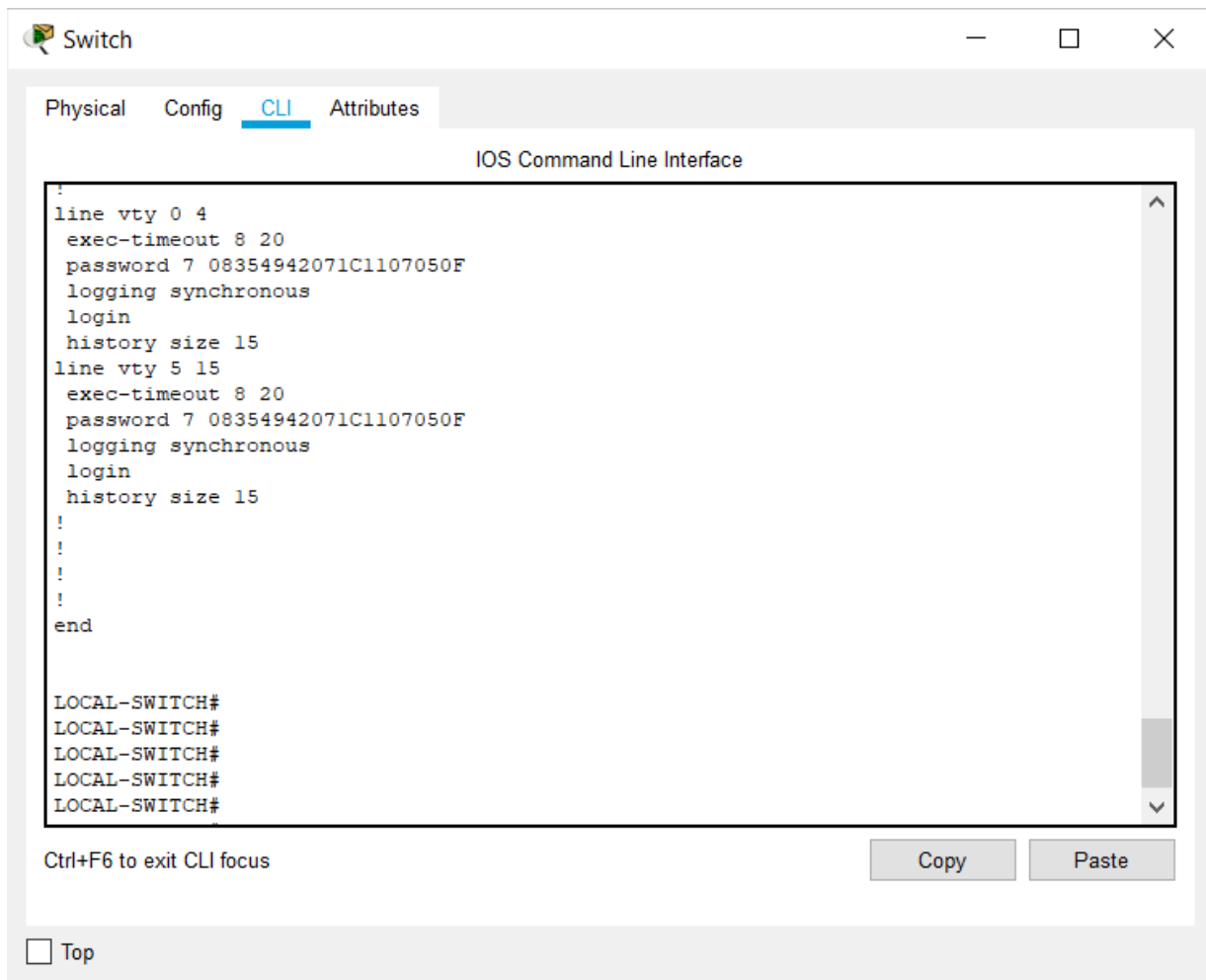
☐ Top

6. Configure TELNET access with the following settings :

- Login enabled
- Password : whatever you like
- History size : 15 commands
- Timeout : 8'20"
- Synchronous logging



Show run command to display the configurations:



The screenshot shows a window titled "Switch" with a tabbed interface. The "CLI" tab is selected, displaying the "IOS Command Line Interface". The configuration text is as follows:

```
!
line vty 0 4
  exec-timeout 8 20
  password 7 08354942071C1107050F
  logging synchronous
  login
  history size 15
line vty 5 15
  exec-timeout 8 20
  password 7 08354942071C1107050F
  logging synchronous
  login
  history size 15
!
!
!
!
end

LOCAL-SWITCH#
LOCAL-SWITCH#
LOCAL-SWITCH#
LOCAL-SWITCH#
LOCAL-SWITCH#
```

Below the text area, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". At the bottom left, there is a checkbox labeled "Top".



7. Configure the IP address of the switch as 192.168.1.2/24 and its default gateway IP (192.168.1.1).

Switch

Physical Config **CLI** Attributes

IOS Command Line Interface

```
LOCAL-SWITCH>enable
Password:
LOCAL-SWITCH#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
LOCAL-SWITCH(config)#interface VLAN1
LOCAL-SWITCH(config-if)#ip address 192.168.1.2 255.255.255.0
LOCAL-SWITCH(config-if)#default-gateway 192.168.1.1
^
% Invalid input detected at '^' marker.

LOCAL-SWITCH(config-if)#ip default-gateway 192.168.1.1
LOCAL-SWITCH(config)#end
LOCAL-SWITCH#
%SYS-5-CONFIG_I: Configured from console by console

LOCAL-SWITCH#show run
Building configuration...

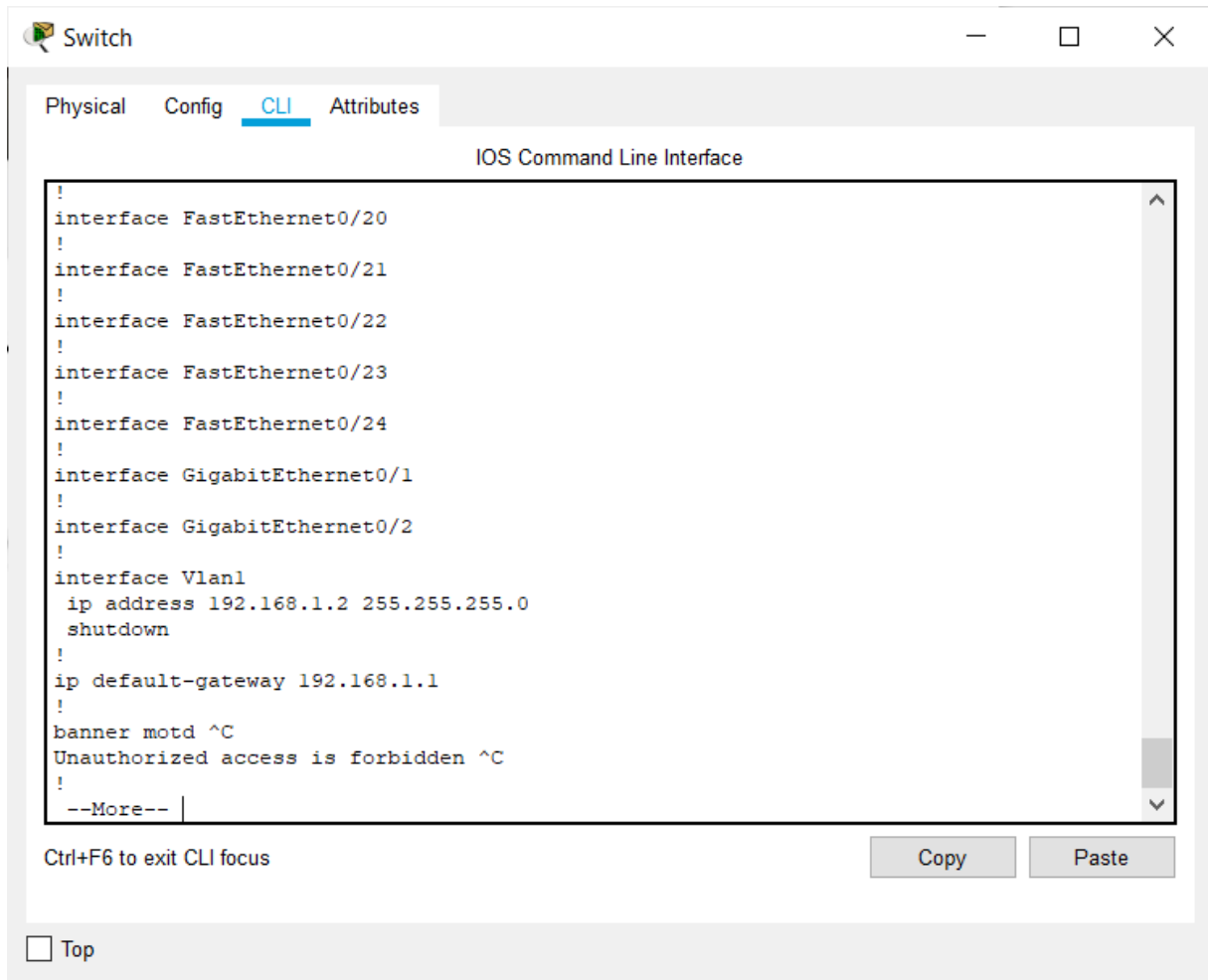
Current configuration : 1516 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Show run to display the configurations:

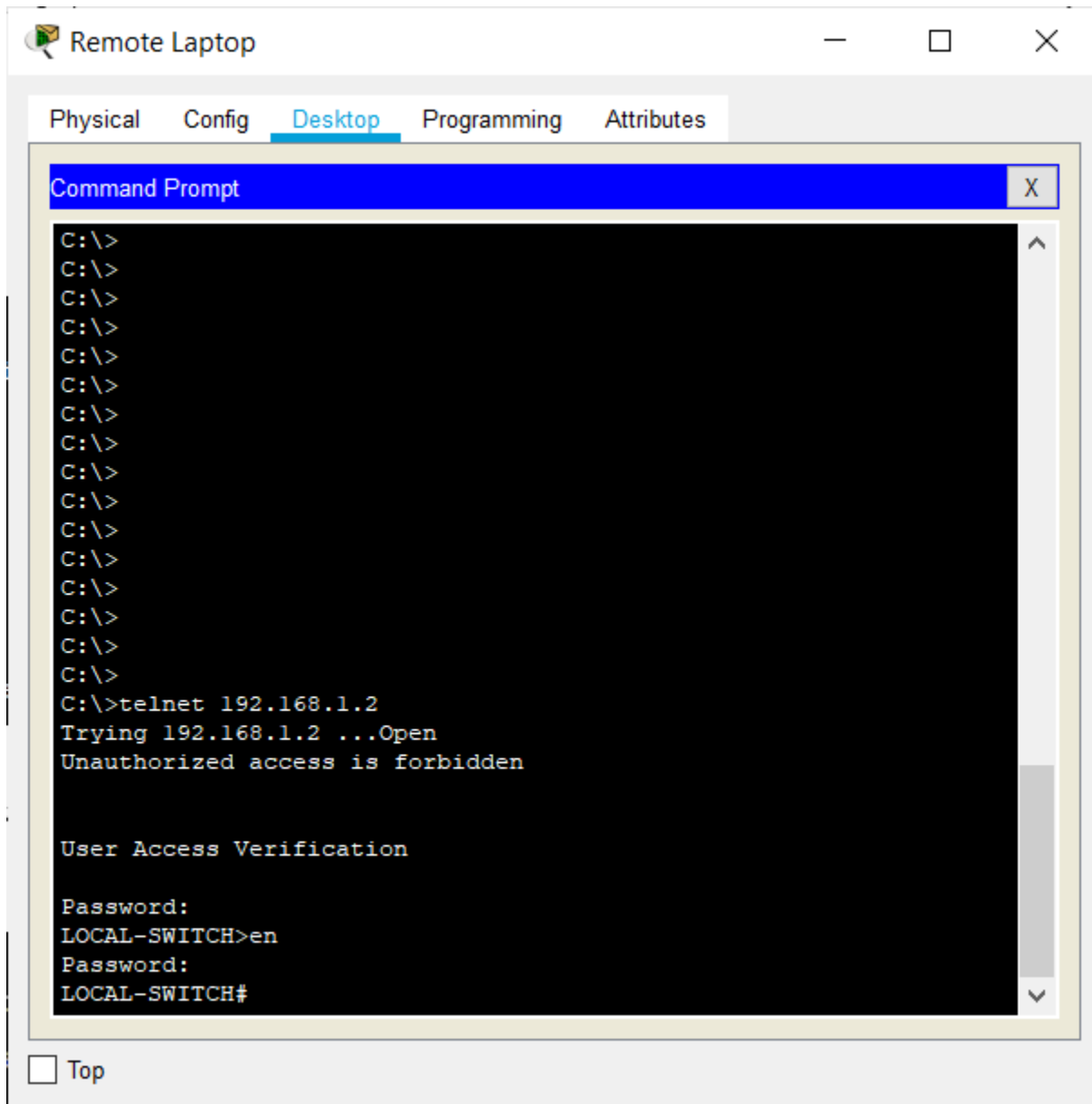


The screenshot shows a web-based configuration interface for a network switch. The window has a title bar with a 'Switch' icon and standard minimize, maximize, and close buttons. Below the title bar are four tabs: 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is selected and highlighted in blue. The main content area is titled 'IOS Command Line Interface' and contains a text box with the following configuration output:

```
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
  ip address 192.168.1.2 255.255.255.0
  shutdown
!
ip default-gateway 192.168.1.1
!
banner motd ^C
Unauthorized access is forbidden ^C
!
--More--
```

Below the text box, there is a status bar with the text 'Ctrl+F6 to exit CLI focus' on the left and two buttons, 'Copy' and 'Paste', on the right. At the bottom left of the window, there is a checkbox labeled 'Top'.

8. Test telnet connectivity from the Remote Laptop using the telnet client.



Password protected switch console:

```
LOCAL-SWITCH>logout
```

```
LOCAL-SWITCH con0 is now available
```

```
Press RETURN to get started.
```

```
Unauthorized access is forbidden
```

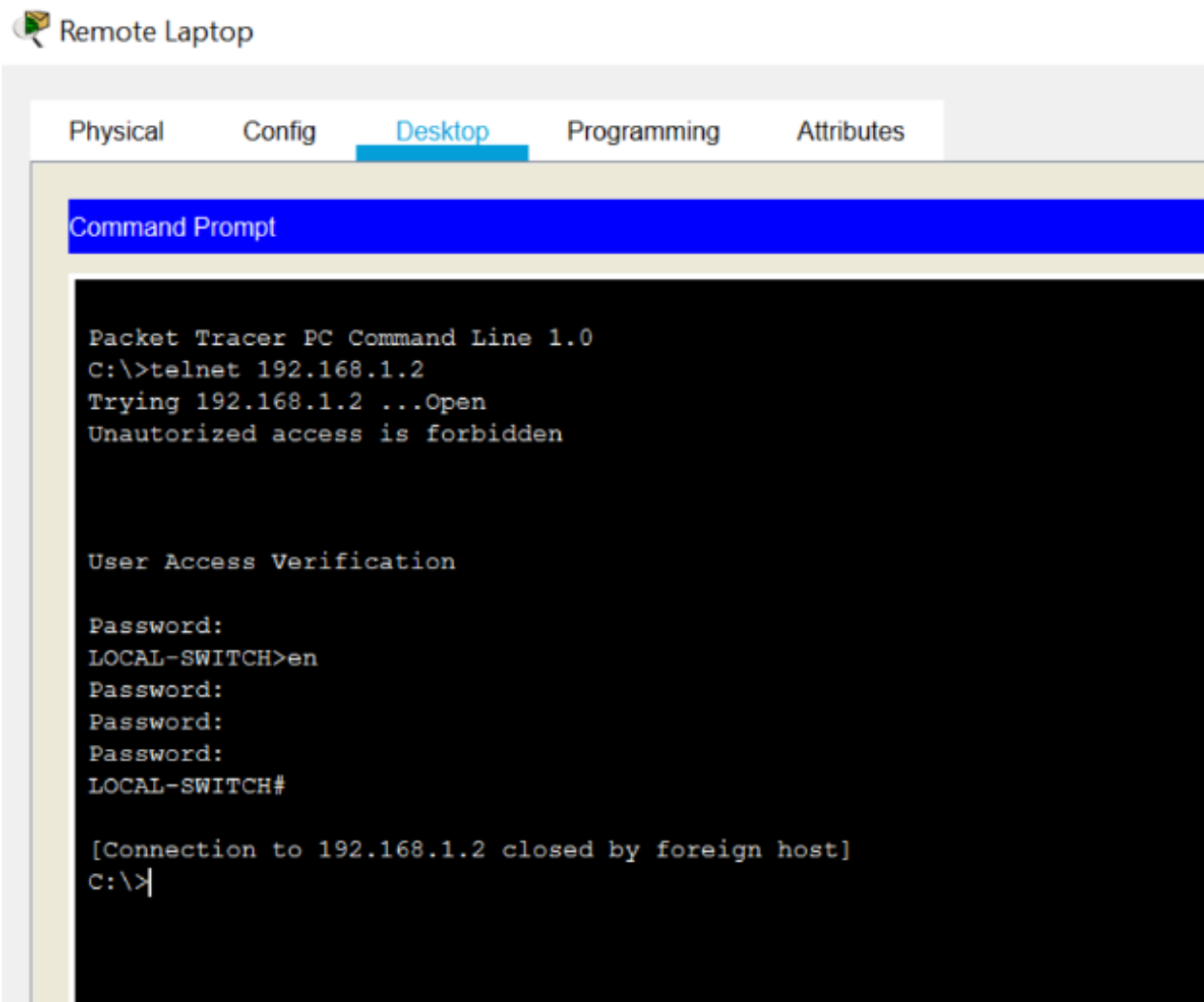
```
User Access Verification
```

```
Password:
```

```
LOCAL-SWITCH>
```

☐ [Top](#)

After waiting for the timeout period, telnet connection is terminated by the host



Remote Laptop

Physical Config Desktop Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>telnet 192.168.1.2
Trying 192.168.1.2 ...Open
Unauthorized access is forbidden

User Access Verification

Password:
LOCAL-SWITCH>en
Password:
Password:
Password:
LOCAL-SWITCH#

[Connection to 192.168.1.2 closed by foreign host]
C:\>
```